

# BULLETIN

## OF THE INSTITUTE OF METALS

VOLUME 4

AUGUST 1959

PART 24

### INSTITUTE NEWS

#### Appointment of Editorial Board

The Council of the Institute has been aware for some time that, although the contents of the *Journal* are of a very high standard, the variety of papers published has not been such as to satisfy the needs of all sections of the Institute's membership. In an attempt to rectify this lack of balance, the Council has recently appointed an Editorial Board which will have general responsibility for all Institute publications. One of the Board's first tasks will be to obtain a greater variety of papers for the *Journal* and, among other things, to ensure that each issue contains at least one paper dealing with some aspect of metallurgical plant and its operation.

The principal responsibility of the Board will be to maintain a balance of interest in the *Journal* and to co-operate with other Committees to that end. It will also make recommendations to Council regarding publication policy and the scope of the Institute's publications and will be responsible for implementing the policy agreed upon.

In connection with its duties, the Board will consider the proposals of Committees involving publication or meetings; it may commission articles or books for publication, and will co-ordinate the planning of subjects for discussion at meetings. It will also be responsible for the make-up of the Institute's publications, their composition, style, format, and production.

The constitution of the Board is as follows:

Dr. L. B. HUNT (*Chairman*)

Dr. W. A. BAKER.

Dr. MAURICE COOK.

Mr. F. DICKINSON.

Dr. IVOR JENKINS.

The Right Hon. Lord KIRKWOOD.

*Ex-officio:*

Mr. G. L. BAILEY (*President*).

Major C. J. P. BALL (*Chairman, Finance and General Purposes Committee*).

#### "Metallurgical Reviews"

The latest issue of *Metallurgical Reviews* (Vol. 4, No. 14) contains: "Direct Experimental Evidence of Dislocations", by P. B. Hirsch, "Friction and Its Measurement", by F. T. Barwell, and "The Production of Sheet and Strip from Metal Powders", by G. Naeser and F. Zirm.

#### Symposium on "The Application of Thin-Film Techniques to the Electron-Microscopic Examination of Metals"

The present issue of the *Journal* contains eight papers specially invited for a symposium entitled "The Application of Thin-Film Techniques to the Electron-Microscopic Examination of Metals". This symposium, which is organized by the Metal Physics Committee of the Institute, will take place at the Royal Institution, Albemarle Street, London, W.1, on Thursday, 12 November, beginning at 9.30 a.m. and continuing in the afternoon at 2.15 p.m. A conversazione for those attending the meeting will be held at the Institute's headquarters, 17 Belgrave Square, S.W.1, on the previous evening. Tickets, price 6s., will be obtainable from the Secretary for the conversazione. No registration will be necessary for attendance at the symposium itself.

During the last few years revolutionary developments have occurred in the application of the electron microscope to the study of metals. Instead of replicas being prepared, metals in the form of thin films are now examined directly by transmission, and as a result a wealth of new information has been obtained.

It is now possible to see directly dislocations and their movements and interactions; the early stages of precipitation can be followed in much greater detail than was possible previously, and the role of vacancies and dislocations in precipitation reactions is being clarified. Recrystallization, phase transformations by shear, order-disorder reactions, and radiation damage are further topics under active investigation with the aid of these powerful methods. The papers give some account of the achievements of these methods so far.

#### Election of Members

The following 1 Overseas Sustaining Member, 18 Ordinary Members, 6 Junior Members, and 5 Student Members were elected on 4 August 1959:

*As Overseas Sustaining Member*

KHANDELWAL FERRO ALLOYS, LTD., 63 The Mall, Kamptec, Nagpur District, India.

*As Ordinary Members*

BARTH, Vincent David, M.Sc., Metallurgical Engineer, Battelle Memorial Institute, Columbus, O., U.S.A.

BEAN, George William, Heat-Treatment Specialist, Joseph Lucas (Gas Turbines), Ltd., Burnley, Lancs.

BOSTON, Malcolm E., M.A., Director, Torvac, Ltd., Histon, Cambridge.



DAVERGNE, Emile Abel, Ing., Directeur-Adjoint de l'Usine de Dives-sur-Mer, Compagnie Générale du Duralumin et du Cuivre (CEGEDUR), Dives-sur-Mer (Calvados), France.

EGRE, Pierre Antony Louis, President, Centre d'Information du Nickel, 47 bis Avenue Hoche, Paris (8e), France.

ERASMUS, Leslie Andrew, B.Sc.(Eng.), Engineering Metallurgist, Steel, Pecc and Tozer, Sheffield.

GREGG, Sidney John, D.Sc., Ph.D., A.R.C.S., F.R.I.C., Reader in Chemistry, Washington Singer Laboratories, University of Exeter.

DE JACQUIER DE ROSEE, Baron Emmanuel, Directeur-Gérant, Société en Commandite Simple de Rosee & Co., Usines à Cuivre de Moulins, Moulins-Warnant (Namur), Belgium.

JOLIFFE, Kenneth Herbert, B.Sc., Ph.D., A.Inst.P., Physicist, Central Electricity Generating Board, c/o Department of Metallurgy, Royal School of Mines, London, S.W.7.

LEREBOURS PIGEONNIERE, Professor Jean, Professeur à l'Ecole des Mines de Paris; Directeur Général Adjoint, Acieries et Forges de Firminy, 6 rue de La Rochefoucauld, Paris (9e), France.

MOSDALE, Derek, B.Sc., A.I.M., Senior Scientific Officer, D.M.T.R., U.K. Atomic Energy Authority (Industrial Group), D.E.R.E., Dounreay, Caithness.

PERTWEE, Kenneth Stuart Guy, B.Sc., Metallurgist, General Electric Co., Lamp Division, Nela Park, Cleveland 12, O., U.S.A.

PFEIFFER, Claes Fredrik Håkan, AB Atomenergi, Lövhölmavägen 7, Stockholm, Sweden.

PROPERZI, Ilario, President, S.P.A. Continuu, Via Cosimo del Fante 10, Milano, Italy.

SCHMICK, Heinrich Hugo Otto Werner, Dr.-Ing., Technisches Vorstandsmitglied, Kabel- und Metallwerke Neumeyer A.G., Klingenhofstrasse 72, Nürnberg, Germany.

SMITH, William James Burling, Dipl. R.T.C., A.I.M., Development Engineer, Charles Clifford Group of Companies, Fazeley Street Mills, Birmingham 5.

SUKOLSKI, Peter John, B.E., Senior Metallurgist, McKeechnie Bros. Ltd., Aldridge, near Walsall, Staffs.

SWAIN, John Arthur, Chief Engineer, Steelworks Plant and Equiverse Division, Incandescent Heat Co., Ltd., Smethwick, Birmingham.

#### *As Junior Members*

BARNBY, Joseph Terence, B.Sc., Ph.D., Research Investigator, Fulmer Research Institute, Stoke Poges, Bucks.

DONACHIE, Matthew John, Jr., B.Met.E., S.M., Met.E., Sc.D., Group Leader, General Dynamics Corp., Electric Boat Division, Research Laboratory, Groton, Conn., U.S.A.

HINE, John Michael, Metallurgist, J. A. Prestwich Industries, Ltd., London, N.17.

HULTGREN, Frank Alexander, B.S., Research Assistant, Department of Chemical and Metallurgical Engineering, University of Michigan, Ann Arbor, Mich., U.S.A.

NOVICK, David Theodore, B.S., S.M., Junior Engineer, International Business Machines Corp., Poughkeepsie Research Centre, P.O. Box 390, Poughkeepsie, N.Y., U.S.A.

WILSON, Thomas Brian, L.I.M., Metallographer, C. A. Parsons and Co., Ltd., Nuclear Research Centre, New-castle-on-Tyne.

#### *As Student Members*

BAINBRIDGE, Ian Frank, Technical Assistant, Aeronautical Research Laboratories, Lorimer Street, Fishermen's Bend, Melbourne, Vict., Australia.

DENISE, Richard William, Student, School of Mines and Metallurgy, University of Missouri, Rolla, Mo., U.S.A.

FABINIAC, Richard Chester, B.S., Research Assistant, Department of Metallurgy, University of Pennsylvania, Towne Building, Philadelphia, Pa., U.S.A.

MORLEY, Michael, Student, Battersea College of Technology, London, S.W.11.

WRIGHT, Victor Sydney, Research Assistant, Rolls-Royce, Ltd., Littleover, near Derby.

## PERSONAL NOTES

DR. W. O. ALEXANDER has been elected a Vice-President of the Institution of Metallurgists.

DR. FRANK M. ALMETER has completed the requirements for a Ph.D. degree in Engineering (Metallurgy) at the Imperial College of Science and Technology and is now Research Metallurgist with Convair-Pomona, a division of General Dynamics Corp., at Pomona, Calif.

MR. B. J. ALPERIN has been appointed Supervisor, Inspection, of the General Electric Company's foundries at Everett, Mass.

MR. I. A. BAILEY has been appointed Managing Director (Operations) of The Mond Nickel Co., Ltd. He will continue to serve as Managing Director of Henry Wiggin and Co., Ltd.

DR. B. R. BANERJEE, formerly Senior Project Physicist at the Research and Development Department, Standard Oil Co., Ind., is now Supervisor of the Applied Physics Section of Central Research Laboratory, Crucible Steel Company, Pittsburgh, Pa.

MR. W. BARR, Chief Metallurgist of Colvilles Ltd., has been elected a Vice-President of the Institute of Welding.

MR. W. BONSACK, formerly in practice as a consultant on cast light metals, is now Chief Metallurgist to Aluminum and Magnesium, Inc.

MR. R. D. BURN, of the British Metal Corporation, Ltd., has been elected a Member of Council of the British Non-Ferrous Metals Research Association.

PROFESSOR ALLISON BUTTS, Professor Emeritus of Metallurgy at Lehigh University, has received the Mineral Industry Education Award of the American Institute of Mining, Metallurgical, and Petroleum Engineers.

DR. L. A. CARAPPELLA, Vice-President of Sylvania Corning Nuclear Corp., Long Island, New York, was the recipient of the Distinguished Alumni Award at the June Commencement exercises of Michigan State University. The award is the first in the history of that University.

MR. R. M. CHAPMAN has been appointed Lecturer in Industrial Metallurgy at Loughborough College of Technology.

MR. I. R. M. CHASTON has been awarded the William Frecheville Student's Prize of the Institution of Mining and Metallurgy.

DR. B. CINA has left Brown-Firth Research Laboratories and is now with the Israel Atomic Energy Commission, Haifa.



MR. GEOFFREY CUNLIFFE has been appointed Managing Director of Norcross Ltd.

PROFESSOR J. W. CUTHBERTSON has been elected a Vice-President of the Institution of Metallurgists.

MR. JOHN DEARDEN, Assistant Superintendent (Metallurgy Division), British Railways Research Department, Derby, has been appointed Superintendent (Metallurgy Division) in place of Mr. T. Henry Turner, who has retired.

MR. F. DICKINSON has been appointed a Director of The Mond Nickel Co., Ltd. He will continue to serve as Manager of the Company's Development and Research Department.

MR. H. D. FORBES is now a staff metallurgist with the General Technical Department, Fabricating Division, Aluminium Company of Canada, Ltd.

DR. R. W. FOUNTAIN has been appointed a technical supervisor in the Metals Research Group of the Technology Department of Union Carbide Metals Company, Niagara Falls, N.Y.

DR. H. T. HALL has relinquished his Lectureship in Metallurgy in the Faculty of Technology of the University of Manchester and has taken up an appointment as Head of the Metallurgical Department, County Technical College, Wednesbury.

MR. J. O. HITCHCOCK has been appointed Managing Director (Commercial) of The Mond Nickel Co., Ltd.

MR. C. R. W. HUGHES has left John Summers and Sons, Ltd., to join British Ropes, Ltd., Doncaster, as Group General Export Manager.

MR. L. KENWORTHY, of the Admiralty Materials Laboratory, has been elected Chairman of the Corrosion Group of the Society of Chemical Industry.

MR. R. E. LENHART has joined the Beryllium Corp., Reading, Pa., as manager of alloy development. He was formerly in the power transformer department of General Electric Co., Pittsfield, Mass.

DR. R. F. MEHL is relinquishing his position as Head of the Department of Metallurgical Engineering at Carnegie Institute of Technology, Pittsburgh 13, Pa., in order to devote more time to research. He will continue to serve as Dean of Graduate Studies and Director of the Metals Research Laboratory.

MR. W. A. C. NEWMAN has been made an honorary member of the Institution of Mining and Metallurgy in recognition of his services to the Institution (of which he is a Past President) and to metallurgical education.

PROFESSOR N. J. PETCH, Professor of Metallurgy in the University of Leeds, has been appointed to the Chair of Metallurgy at King's College, Newcastle-upon-Tyne.

DR. L. B. PFEIL has been appointed Managing Director (Research and Technical) of The Mond Nickel Co., Ltd.

DR. P. E. PRICE has left Allegheny Ludlum Steel Corp. to take up an appointment in the Electronics Chemical Division of Merck and Co., Danville, Pa.

DR. A. G. RAMSAY has been appointed a Director of Henry Wiggin and Co., Ltd. He will continue in his position as Director of The Mond Nickel Co., Ltd., resident at Clydach, Swansea.

DR. R. J. ROHR has joined G. H. Packwood Manufacturing Co., St. Louis, Mo., as Assistant to the President and Director of Research and Development.

MR. P. RYDER has now retired from Charles Clifford, Ltd., Birmingham.

PROFESSOR R. SCHUHMAN, Jr., has been appointed Head of the newly established School of Metallurgical Engineering at Purdue University, West Lafayette, Ind.

DR. R. B. SIMS has been appointed a Director of Davy and United Instruments, Ltd., Sheffield.

MR. S. G. TEMPLE has been elected President of the Birmingham Metallurgical Society.

DR. H. WEVER, Institut für Metallkunde der Technischen Universität, Berlin, has been awarded the Masing Memorial Prize for 1958 by the Deutsche Gesellschaft für Metallkunde.

MR. E. C. WILLIAMS has left Imperial Chemical Industries, Ltd., Metals Division, to become Manager of the Research and Development Department, Steatite and Porcelain Products, Ltd., Stourport-on-Severn, Worcs.

DR. C. M. ZENER, Director of the Westinghouse Research Laboratories, Pittsburgh, Pa., has been elected a member of the U.S. National Academy of Sciences.

## Deaths

The Editor regrets to announce the deaths of:

JOHN AMBROSE MATTHEWS on 22 July. He had been with the Eagle Star Insurance Co., Ltd., for 30 years and had been Chief Engineer since 1946.

HANS TZSCHASCHEL, a Director of Norddeutsche Affinerie, Hamburg, on 3 May, aged 49.

The Right Hon. Lord WEIR of Eastwood, Honorary President of G. and J. Weir, Ltd., Glasgow, on 2 July. He was an Original Member of the Institute.

WILLIAM WILLIAMS, Chairman of Sklenar Furnaces, Ltd., Cardiff, on 27 May, aged 75.

## OBITUARY

### Professor W. M. Guertler

Professor W. M. Guertler, doyen of German metallurgists, died in Berlin on 21 March 1959, a few days after his 79th birthday.

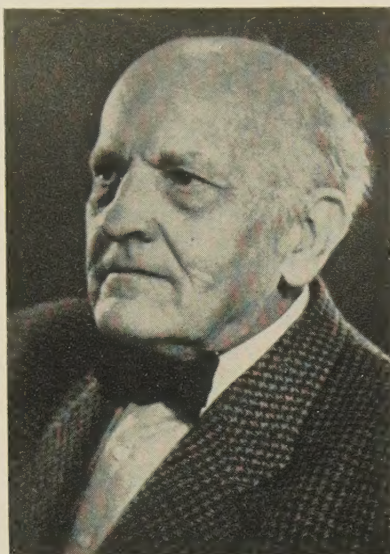
William Minot Guertler was born in Hanover in 1880 of a German father and American mother. After being educated at Hanover, Helmstedt, and Munich, he graduated in 1904 at the University of Göttingen, where he was the first pupil of Gustav Tammann. He remained as research assistant to Tammann for three years and then went to Berlin. There he was appointed lecturer at the Technische Hochschule and shortly afterwards he spent a year as Research Associate at the University of Boston. In 1917 he was appointed a Professor at the Technische Hochschule, Berlin, and he was also appointed Deputy Director (1921) and later Director (1929) of the Metallhüttenmännische Institut there. He became Professor and Director of the Institut für angewandte Metallkunde at the Technische Hochschule, Berlin, in 1933, and three years later he was also appointed Director of the Institut für Metall- und Werkstoffkunde at the Technische Hochschule, Dresden.



He held both these posts until he reached the retiring age in 1945. He was then appointed Visiting Professor at the Technical University, Istanbul, and continued to lecture there until 1956.

Guertler visited America on several occasions and was the first German scientist to be invited to give the Campbell Memorial Lecture. He also visited Japan and India.

The number of papers published by Guertler during his long and active career was well over 300, and he had more than 100



patents and patent applications to his name. His most important work was the text-book "Metallographie", which began to appear in 1909 and ran to several volumes. He was also responsible for founding, in 1911, the *Internationale Zeitschrift für Metallographie*, which later became the *Zeitschrift für Metallkunde*. The formation of the Deutsche Gesellschaft für Metallkunde was largely the result of Guertler's efforts, a fact which the society recognized by making him an honorary member in 1954.

## OTHER NEWS

### British Association of Corrosion Engineers

At a meeting held in London on 29 May 1959, the formation of the British Association of Corrosion Engineers was announced.

The objects of the Association will be generally to promote the dissemination of technical information about corrosion matters and to develop by means of social activities the free interchange of information among members. In due course the Association, which is essentially non-profit making, will progress towards the establishment and acceptance of suitable qualifications for corrosion engineers, and the promotion of standardization in the terminology and techniques of corrosion control.

When the Association is in full operation, it is intended to hold full-scale meetings with papers, films, and discussions. Full details and membership application forms can be obtained from the Hon. Secretary, British Association of Corrosion Engineers, 97 Old Brompton Road, London, S.W.7.

### Creep Information Centre

A Creep Information Centre is being set up at the National Engineering Laboratory so that data on the strength properties of high-temperature materials may be made readily available to industry from one source. It is hoped that all producers of high-temperature materials and users of these materials will pool their information. Commercial security may restrict the publication of some of the data, but, subject to this consideration, it is intended to issue high-temperature data for British materials in an agreed form.

In the first place all the available data on creep and rupture properties of conventional high-temperature materials will be collected and tabulated. Later it is intended to include data on all mechanical properties of these materials and also information about test procedures and testing machines; data on foreign materials may also be included.

It will be some time before the scheme becomes fully effective, but it is hoped that eventually CIC will become the national centre for data on the mechanical properties of British and foreign high-temperature materials and test methods.

At present it is considered that the Centre should perform some of the following functions:

#### (1) High-Temperature Materials

(a) To collect experimental data on creep and other mechanical properties of high-temperature materials in the form of original curves and laboratory reports, published papers, catalogues, and trade literature.

(b) To tabulate these data and make them available to industry.

(c) To collect British and foreign specifications for standard high-temperature materials.

#### (2) Equipment and Test Procedures

(a) To collect details of British and foreign testing machines for high-temperature work, and information about test procedures.

(b) To produce lists of references on particular aspects of high-temperature testing and mechanical properties.

(c) To prepare a manual on the testing of high-temperature materials.

(d) To organize discussions on high-temperature test procedures.

#### (3) Liaison with Other Organizations

(a) To maintain contact with all committees in the United Kingdom concerned with high-temperature materials.

(b) To appoint a technical liaison officer to keep in contact with all British high-temperature laboratories, with a view to co-ordinating the development of testing equipment and techniques.

(c) To prepare a summary of the major projects and test programmes of British high-temperature laboratories.

(d) To make contact with overseas organizations so as to foster international co-operation in investigating problems relating to the use of engineering materials at high temperatures.

#### (4) Museum of High-Temperature Failures

(a) To collect samples (with case histories) of failures of high-temperature materials from industry and other organizations.

Data and requests for information should be sent to: The Director, National Engineering Laboratory, East Kilbride, Glasgow. Telephone: East Kilbride 20222.



### B.I.S.R.A. Open Days

The British Iron and Steel Research Association is planning two Open Days at its laboratories at Battersea Park Road, London, S.W.11, on Thursday and Friday, 22 and 23 October.

The Open Days will provide an opportunity for showing the current and continuing work of B.I.S.R.A.'s London Group Laboratories, which, besides the Battersea premises, include part of the Ironmaking Division housed at the Imperial College of Science at South Kensington. The Battersea premises house the laboratories of the Association's Plant Engineering and Energy Division, and the Departments of Physics, Chemistry, and Operational Research.

Formal invitations to the Open Days have been issued to the Association's member firms. In addition, a general invitation is extended to all industrialists and others interested in the engineering and technical problems which concern the iron and steel industry. Anyone wishing to attend should apply to the Information Officer, B.I.S.R.A., 11 Park Lane, London, W.1.

### The Indian Institute of Metals

The Thirteenth Annual Technical Meeting of The Indian Institute of Metals will be held in Bangalore from 1 to 5 December 1959. The programme will include a Symposium on "Structural Changes in Metals and Alloys", arranged in collaboration with the Department of Metallurgy, Indian Institute of Science, Bangalore 12. The Symposium forms part of the Golden Jubilee Celebrations of the Indian Institute of Science.

The Sixth Metallographic Contest and Exhibition will also be held during this Session. In addition to the Technical Sessions, the programme will include works visits and social functions.

The Eighth Pandya Memorial Lecture will be delivered by Dr. S. Bhagavantam, Director of The Indian Institute of Science.

A cordial invitation to take part in this meeting is extended to any member of the Institute of Metals who may be in India at the time. Further details may be obtained from The Indian Institute of Metals, 31 Chowringhee Road, Calcutta 16.

### International Union of Chemistry

The Fifth General Assembly and International Congress of the Union of Crystallography will be held in Cambridge from Monday, 15 August to Saturday, 20 August 1960; two Symposia associated with the Congress will follow during the period 22-24 August. The programme of the Congress will include the presentation of original papers, exhibitions of publications and apparatus, excursions (probably on 17 and 21 August), social activities, and events for those accompanying members. One of the symposia will deal with "Lattice Defects in Solids and Their Influence on the Strength of Solids."

An Advance Booklet containing registration forms and detailed information will be published in October 1959. Crystallographers who wish to receive a personal copy as soon as it is available are requested to register their names with the Chairman of the Congress Executive (Dr. W. H. Taylor, Crystallographic Laboratory, Cavendish Laboratory, Cambridge, England).

### Chemical Society Research Fund

The Research Fund of the Chemical Society provides grants for the assistance of research in all branches of Chemistry.

About £700 per annum is available for this purpose. Applications for grants will be considered in November next and should be submitted on the appropriate form not later than Saturday, 14 November 1959. Applications from Fellows will receive prior consideration.

Forms of application, together with the regulations governing the award of grants, may be obtained from the General Secretary, The Chemical Society, Burlington House, Piccadilly, London, W.1.

### Inco Research Fellowship

The establishment of a fellowship to honour the recent visit of Her Majesty the Queen and His Royal Highness Prince Philip, Duke of Edinburgh, to the nickel mines in the Sudbury area, has been announced by The International Nickel Company of Canada, Ltd., and The Canada Council, a body established by the Canadian Government for the encouragement of the arts, humanities, and social sciences.

By gracious permission of the Queen, the fellowship will be called "The Queen Elizabeth II Fellowship (The International Nickel Company of Canada, Limited, Royal Tour, 1959)".

The award will be a post-doctoral fellowship tenable for two years. Research can be undertaken in the chemistry or physics of metals, geophysics, geology, metallurgy, mineralogy or mining. Candidates must be Canadian citizens and holders of a doctor's degree, and the fellowship must be held at a Canadian university. Inco has deposited a total of 15,000 dollars with The Canada Council, which will supervise all arrangements for the fellowship.

### Special Courses at Kingston Technical College

Two courses of special lectures have been arranged by the Metallurgy Section of Kingston Technical College during the autumn term. One consists of eight lectures by specialists from industry on "The Chemistry and Metallurgy of Rarer Metals", given on Tuesday evenings, beginning on 20 October. The second course consists of eight lectures on "The Principles of Corrosion and Protection of Metals", given by Mr. G. Isserlis, lecturer-in-charge of the Metallurgy Section at the College. These will be on Thursday evenings, beginning on 22 October. The fee for each course is £1 2s. 6d. and advance registration is advisable. The address of the College is Fassett Road, Kingston-upon-Thames.

### Pittsburgh Diffraction Conference

The annual Pittsburgh Diffraction Conference will be held on 11-13 November 1959, at Mellon Institute, Pittsburgh, Pa. In addition to the usual sessions, plans are being made to devote sessions to stress analysis, refractories and silicates, and biological structures. A symposium on electron microprobe analysis is being arranged. The evening meeting will be addressed by Dr. C. S. Barrett of the University of Chicago. Further information can be obtained from D. W. Beard, Crucible Steel Company of America, 234 Atwood Street, Pittsburgh 13, Pa.

## DIARY

### Local Sections and Associated Societies

**6 October. Oxford Local Section.** "The Martensitic Transformations", by Dr. B. A. Bilby. (Cadena Café, Cornmarket Street, Oxford, at 7.0 p.m.)



## APPOINTMENTS VACANT

- 8 October. **Leeds Metallurgical Society.** "Metallurgical Developments in the Soviet Union", an illustrated talk. (The Metropole Hotel, Leeds, at 6.30 p.m.)
- 8 October. **London Local Section.** "Stress-Corrosion Cracking", by Dr. T. P. Hoar (17 Belgrave Square, London, S.W.1, at 6.30 p.m.).
- 13 October. **South Wales Local Section.** "Metallurgical Applications of the Electron Microscope", by Dr. J. Nutting. (Department of Metallurgy, University College, Singleton Park, Swansea, at 6.45 p.m.)
- 14 October. **Manchester Metallurgical Society.** Presidential Address, by Dr. E. F. Emley. (Manchester Room of the Central Library, Manchester, at 6.30 p.m.)
- 15 October. **Liverpool Metallurgical Society.** Presidential Address: "The Production and Use of Steel Wire and Steel Wire Ropes", by B. Ryan. (Library of the Department of Metallurgy, University of Liverpool, 146 Brownlow Hill, Liverpool 3, at 7.0 p.m.)
- 20 October. **North East Metallurgical Society.** "Metal Spraying", by W. E. Ballard. (Cleveland Scientific and Technical Institution, Middlesbrough, at 7.30 p.m.)
- 21 October. **Liverpool Metallurgical Society.** Visit to Rylands Brothers, Ltd., Warrington.
- 22 October. **Sheffield Local Section.** Symposium on Modern Analytical Techniques: (i) Modern Spectroscopic Techniques, by W. Ramsden; (ii) X-Ray Fluorescence, by Dr. K. W. Andrews. (The Applied Science Building, University, St. George's Square, Sheffield 1, from 2.0 to 5.30 p.m.)

## APPOINTMENTS VACANT

### BRITISH THOMSON-HOUSTON CO., LTD.

The British Thomson-Houston Group Research Laboratory has vacancies for metallurgists with a good honours degree to join a group conducting researches on the powder metallurgy of hard materials. Previous research experience is desirable. Applicants, who should be free from National Service commitments, are invited to write to the Director of Research, The British Thomson-Houston Co., Ltd., Rugby, giving details of age, qualifications and experience, and quoting reference JSJ.

### BRITISH THOMSON-HOUSTON CO., LTD.

The BTH Group Research Laboratory has a vacancy in the Physical Metallurgy Section for a graduate in metallurgy or physics with a good honours degree and preferably some research experience. The work is concerned with research applied to alloy development, structural properties of metals, and evaluation problems applied to nuclear reactors.

Applicants, who should be free from National Service commitments, are invited to write to the Director of Research, The British Thomson-Houston Co., Ltd., Rugby, stating age, qualifications, and experience, and quoting reference OG.

### CENTRAL ELECTRICITY GENERATING BOARD SOUTH WALES DIVISION

Applications invited for superannuable N.J.B. appointment of 3RD ASSISTANT ENGINEER (METALLURGIST OR NON-DESTRUCTIVE TESTING) in the GENERATION DEPARTMENT at DIVISIONAL HEADQUARTERS.

Salary: AX/DX6 £925-£1140 per annum.

Duties include interesting and varied work in connection with maintenance problems in power stations.

Applicants should be Metallurgists, Radiologists, or Radiographers preferably with experience in other branches of non-destructive testing.

Special application forms obtainable from Secretary, South Wales Division, Central Electricity Generating Board, Twyn-y-Fedwen Road, Gabalfa, Cardiff, to be returned by 10 October 1959.

## HOOVER (ELECTRIC MOTORS) LIMITED, CAMBUSLANG, LANARKSHIRE.

### METALLURGIST

Applications are invited for the post of Metallurgist in the Engineering Department, which is responsible for product design, development, and quality control. Candidates should be between 25 and 40 years of age, and it is desirable that they should have general experience including die-casting, metal forming, heat treatment, testing and sampling of materials, and investigation into new materials.

The post is a senior appointment and offers an interesting and varied field of work. Pension and sickness schemes are in operation. Please detail personal history, experience, and qualifications by letter to the Personnel Manager.

### IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY

#### Solid-State Research

A few research bursaries exist for Physicists, Chemists, or Metallurgists with good honours degrees for higher work on (a) deformation characteristics of ceramics, (b) properties of oxide films, (c) structure of liquid alloys, (d) transmission electron microscopy. Minimum value £400 per annum plus fees. Applications to Professor J. G. Ball, Metallurgy Department, Imperial College, London, S.W.7.

**METALLURGIST** as an assistant to the Chief Metallurgist. The work will be connected with the welding of ferrous and non-ferrous alloys, corrosion and general metallurgical problems encountered in the manufacture of plant and equipment for the iron and steel, chemical, oil, and gas industries. The company also produces castings in Meehanite and high-ductile irons, and the appointment will also include work in the foundry for periods as Foundry Metallurgist after suitable training. Applicants should possess A.I.M. or equivalent and be less than 30 years of age. Apply Staff Personnel Manager, Ashmore, Benson, Pease & Co., Stockton-on-Tees.

**METALLURGIST** required by Murex Limited, Rainham, Essex, to work in Research Laboratory on the development of refractory metals. Work is chiefly of practical nature and experimental experience is essential. Salary dependent on qualifications and experience. Good prospects. Excellent working facilities. 5-day week. Pension Fund. Write giving full particulars to Staff Department.

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